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AN ABBREVIATED GUIDE
FOR USERS OF THE MODEL 804A

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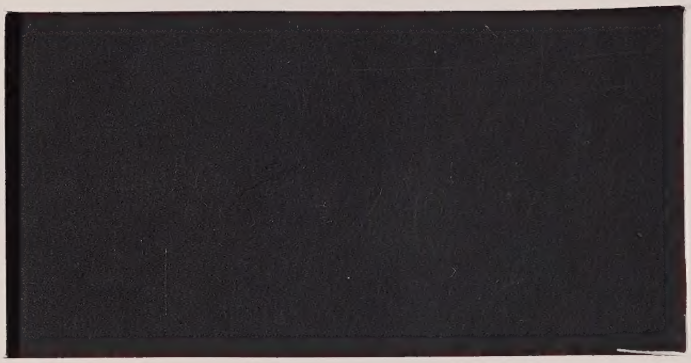

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FOR USERS OF THE MODEL 804A

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MODEL 804A
ABBREVIATED GUIDE FOR USERS OF THE 804A

I. INTRODUCTION

Although the 804A Multi-Channel Signal Processor is a very powerful and flexible analysis system which can be programmed to meet the requirements of individual applications, it is also an instrument which can perform basic signal processing functions at the press of a few keys.

This brief manual is meant as a step-by-step guide to introduce you to setting controls, gathering data, and displaying data. Please refer to the standard 804A manual for complete details on operating the system in both manual and programmed modes.

II. STARTING THE 804A SYSTEM

A. VOLTAGE RANGE VERIFICATION

The 804A can use A.C. voltage ranges of 90 to 125 volts or 180 to 250 volts with a frequency from 48 to 63 Hz. Before proceeding, please verify that the voltage range switch located on the rear panel of the unit is set to the appropriate range.

B. STARTING

In order to start this whole process from the beginning, please open the disk access door. You can do this by inserting a finger into the recess at the right of the slot in the disk drive, and pulling the door forward. If there is a disk in the drive, remove it for now.

Next, set the POWER switch (the rocker switch at the upper right of the front panel) to the OFF position.

C. INPUT CONNECTIONS

Now we'll set up two signal inputs. Signal input connections for the 804A are located on the right side of the unit, and the signal source connections to be used in the following example are located on the left side. Using BNC cables, connect:

1. NB NOISE OUT to Channel A input, and
2. BB NOISE OUT to Channel B input.

D. LOADING THE SYSTEM CONTROL PROGRAM

The internal control program for the 804A is resident on the 804A System Disk and is automatically loaded into the 804A when the system is powered up or reset. Therefore, it's necessary to have the System Disk inserted in the disk drive at these times.

Whenever handling floppy disks:

- never touch the recording surface;
- do not bend the disk jacket;
- do not expose the disk to strong magnetic fields;
- do not spill coffee on the disk;
- always store the disk in a protective sleeve.

Remove the 804A System Disk from its protective sleeve. Then, while grasping the labeled edge of the disk which is opposite the access oval, carefully insert the disk into the drive as shown in Figure 1, with the "write protect" slot or tab pointing down. DO NOT CLOSE THE DOOR YET.

LOADING A DISK

FIGURE 1

Now use the POWER switch to turn on the unit. After the power is on, close the disk drive door. The door should close smoothly without any binding. It is a good practice to open the disk drive door whenever the power is turned on or off. This prevents data on the disk from being altered in the event of a component failure.

The system will now be running through its diagnostic tests to ensure that everything is functioning properly. These diagnostic tests will run whenever the system is powered up or reset. In a minute or so, you should see the message "DEFAULT STARTUP STATES LOADED". If this message does NOT appear before you see a data display, please ask someone at your installation to give you a copy of the original 804A System Disk that was delivered with your unit.

You can restart the system with this disk by:

1. opening the disk access door;
2. removing the disk in the drive;
3. inserting the correct 804A System Disk into the drive;
4. closing the disk drive door;
5. pushing the SYSTEM RESET button (to the left of the POWER switch on the front panel);
6. waiting until a data display appears.

E. THE INITIAL DISPLAY

After the power-up tests are completed, the system control program is loaded from the disk and a display similar to the one shown in Figure 2 appears on the screen. This is referred to as a "dual split display".

INITIAL DISPLAY

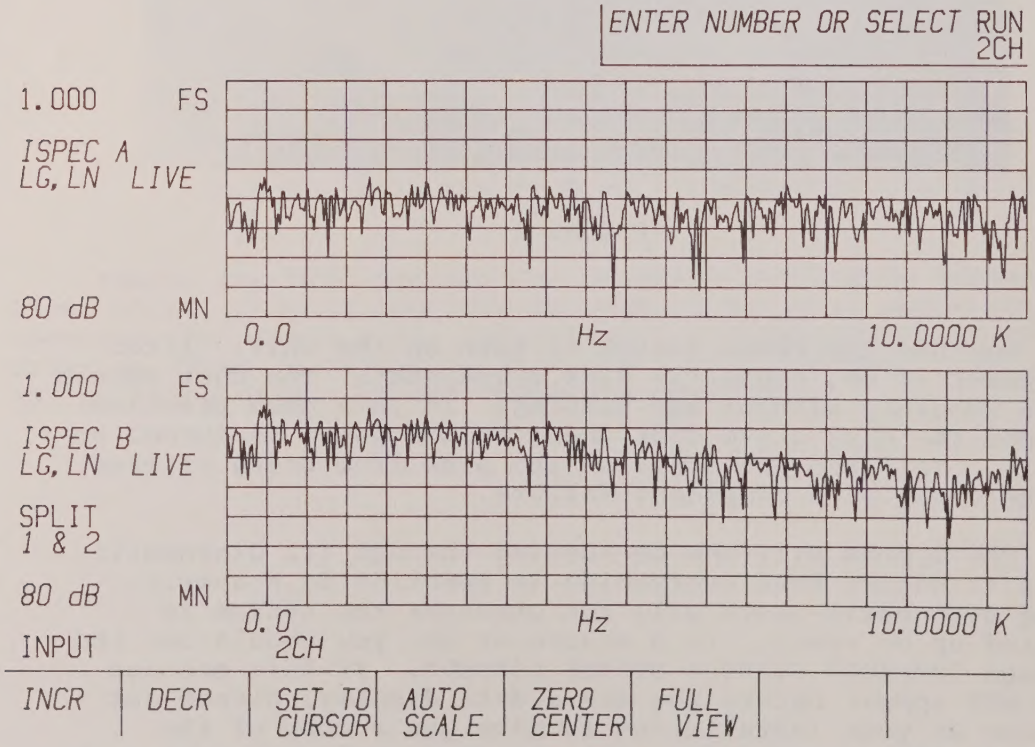

FIGURE 2

The labels ISPEC A and ISPEC B to the left of the upper and lower graticules identify the data on the top and bottom traces as being the instantaneous spectra of Channels A and B. One, two, or four data traces may be displayed at one time, but for now we'll just use the two trace display.

III. GETTING ACQUAINTED

A. THE FIVE BASIC OPERATIONS KEYS

The BASIC OPERATIONS keys in Figure 3 allow you to set up the 8Ø4A System for making measurements. Using these five keys, you can specify all the required parameters for INPUT, FREQuency, and AVERager controls as well as specify display FUNCTions and FORMats.

BASIC OPERATIONS KEYS

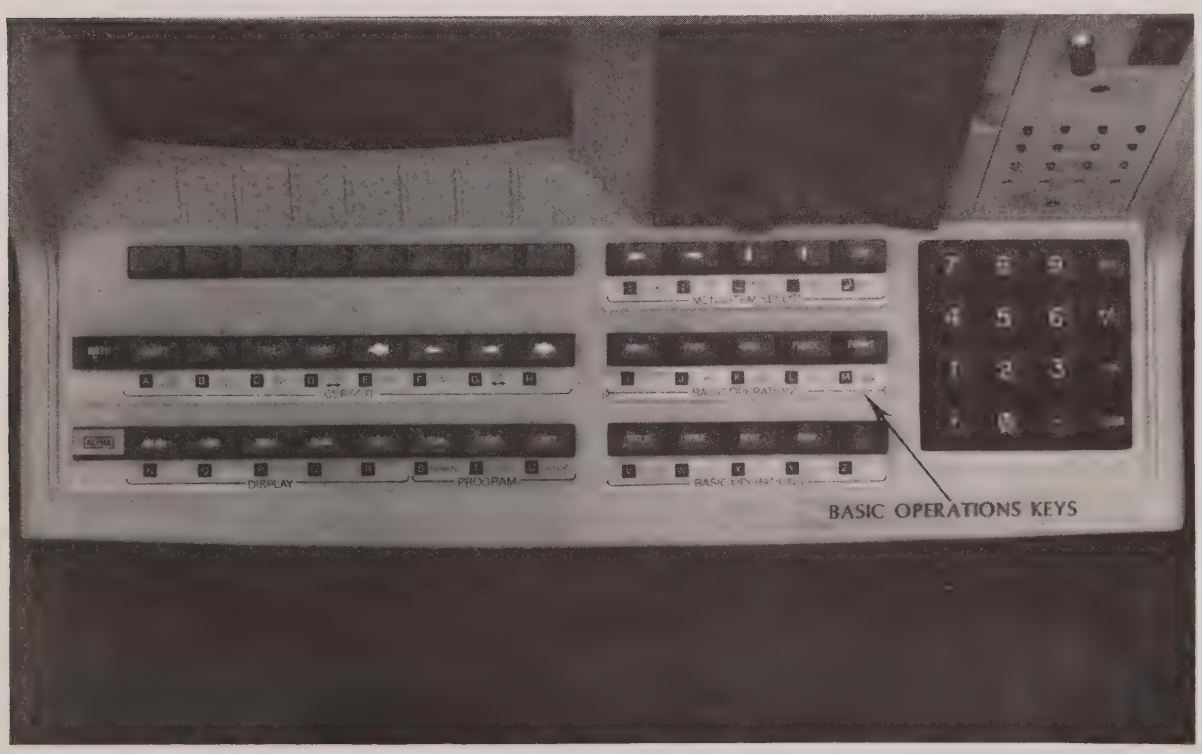

FIGURE 3

B. THE SOFT KEYS, MENU CURSOR, AND VIEW LINE

Now we're ready to get started. First, press the INPUT key. Notice the eight unlabeled keys directly below the display. These are referred to as the SOFT keys since their functions are not rigidly defined. They are used to select options for most of the 804A controls.

The bottom two lines on the display show the current labels for the SOFT keys and define the available options for the "selected" control. The available options are called the MENU for the control, and a MENU CURSOR is moved on the display to select the control of interest. The selected control field is displayed in reverse video.

The line above the SOFT key labels on the display is called the VIEW LINE. Right now the view line contains the input control settings for Channel A. The menu cursor is currently positioned on the input sensitivity control for Channel A which has been initialized to 1 Volt.

Sometimes SOFT keys provide dual options. In this case, for example, the third SOFT key is used to alternately select 10 milliVolts or 1 Volt. Go ahead and press it a couple of times, and note the change in the view line label for the control.

Control fields other than the selected field on the view line are displayed in bright characters (note "A C" for example) while title information (such as "A:") is written in dim characters. Moving the menu cursor on a view line to select other controls will be discussed shortly.

Display fields to the left of or below the graticules which correspond to controls are also indicated by bright characters. Later you'll see how the menu cursor can be moved to these fields to provide even more flexibility in setting controls.

The menu-driven approach used in the 804A System allows you to access control fields directly by simply moving the menu cursor. Then you can choose the option you want by pressing a SOFT key or, in some cases, by entering a number.

IV. SETTING INPUT CONTROLS

A. INPUT SIGNALS

As noted above, the view line selected when you pressed INPUT corresponds to the input control settings for Channel A. Before going on to change the input sensitivity level for this channel, we should discuss the input channels. The 8Ø4A can be used in the 2 channel (A,B) mode or in the 4 channel (A,B,C,D) mode. The wake-up state is the 2 channel mode, indicated by the label "2CH" at the upper right of the display. The processing rate is increased significantly in the 2 channel mode; so it should be used unless the additional channels are actually required.

Notice the indicator lights below the power switch on the front panel. They are referred to as "tree lights" and are used to monitor the peak levels of the input signals for each of the four channels. The top indicators are red and signify that an overload has been detected on the corresponding channel. The center, green indicators are lit when the peak signal level is in the normal range (between overload and 24 dB below overload). The yellow indicators signify that the signal is below the normal range.

B. SELECTING THE INPUT SENSITIVITY LEVEL

Now let's get back to setting the input sensitivity level for Channel A. The first six SOFT keys allow the selection of input sensitivity levels in the range of 2 mVolts to 1Ø Volts RMS full scale. If the input level of a signal is unknown, various levels can be tried and the tree lights can be used as a guide in determining the proper level.

Rather than explicitly selecting a level, you can use the right-most SOFT key to select automatically the optimum level for the particular signal. This is a very convenient feature, especially for automatic test systems where an operator may not be present.

Press the AUTO SCALE SOFT key. While automatic scaling is in progress, observe the tree lights and SOFT key labels as the 8Ø4A changes the setting. The AUTO SCALE key label is in reverse video during the scaling. The green tree light should be lit in the Channel A column when scaling is completed, and the selected level will be shown on the view line.

C. ADDITIONAL INPUT CONTROLS

There's no need to change the other input controls at present, but we'll move the menu cursor to their fields on the view line and briefly mention their functions. The five keys to the right of the SOFT keys are labeled MENU ITEM SELECT and are used to control the menu cursor.

Press the right arrow (-->) key. The menu cursor moves one field to the right and is now positioned on the input coupling control. The only choices for this control are "A C" and "D C" coupling.

Press --> again to move the menu cursor to the next field to the right which is the calibration constant for the Channel A transducer. Unlike other controls that we've seen so far, the SOFT key labels are blank for this control. The message ENTER NUMBER at the upper right of the display indicates that a numeric entry is expected. The field under the message is called the "entry field". A numeric entry is made by entering the number on the numeric keypad and pressing the SET key. The calibration constant is interpreted in volts per "unit of measure".

Move the menu cursor to the last field on the view line. This control is used to specify the "unit of measure" label corresponding to the calibration constant for the transducer. It's initialized to "V" for volts, but you can change it to the proper unit for your current application.

The message in the entry field now reads ENTER UNITS. The label is changed by entering up to 4 characters on the secondary keyboard and pressing SET on the numeric keypad. When the data cursor (it'll be discussed later) is on, amplitude readings will be labeled with the unit specified.

The left arrow key (<--) in the MENU ITEM SELECT group can be used to move the menu cursor left on the view line to reselect fields in case you change your mind on a specification. The ↑ and ↓ arrows will be discussed later.

D. INPUT VIEW LINES FOR CHANNELS B - D

There is an input view line corresponding to each of the 4 channels. To access the view line for Channel B, simply press INPUT again. Note the label "B:" at the left of the line. It is not necessary to have moved the menu cursor to the last field on the Channel A view line (as we did above) before pressing INPUT again for the B INPUT view line.

Auto scale the input sensitivity level for Channel B as you did for A. The green tree light in the B column should now be lit. If Channels C and D were of interest, INPUT could be pressed twice more to select their view lines. Pressing INPUT when the Channel D line is selected causes the Channel A line to be recalled.

V. SETTING FREQUENCY CONTROLS

Now press the second BASIC OPERATIONS key which is labeled FREQ. It's not necessary to use the BASIC OPERATIONS keys in order, but it's often a convenient, systematic approach to setting up the controls.

The first control on the frequency view line selects either the BASE band or ZOOM band mode of gathering input time data. In the base band mode, frequency spans of from 1 Hz to 40 kHz are available with a resolution of 1/400th of the span. In the zoom band mode, bands of width 1 Hz to 20 kHz can be positioned anywhere up to 40 kHz in order to achieve finer frequency resolution.

The wake-up state for this control is base band which is also the mode that we'll be using now. Please verify that BASE is still selected.

Now move the menu cursor to the second, and last, field on this view line by pressing --> in the MENU ITEM SELECT key group. This control is used to select the frequency span, or analysis range. The first 7 SOFT keys have dual functions. Use the second SOFT key to select the 1 kHz range.

The upper limit of the horizontal axis is annotated at the lower right of the graticules. Notice that the horizontal axes were automatically rescaled to reflect the new analysis range so that you didn't have to worry about manually rescaling them. Automatic horizontal scaling is optional, but usually it's convenient to let the 804A do the work for you.

VI. SETTING UP AVERAGER CONTROL PARAMETERS

Now press the AVER key to recall the averager controls to the view line. These five controls are used to specify parameters which affect the averaging process rather than to actually run the averager. You'll see later that the OPERate key provides the means of starting and stopping the averager.

Although we're not ready to do any averaging yet, the averager control parameters may be set up in advance. These parameters, as well as notes on when to select different types of averaging and weighting functions, are described in detail in the standard manual.

The first field on the line allows the selection of the averaging domain. The 804A can average input TIME waveforms as well as spectra in the FREQuency domain. If FREQ is not selected, please press the 2nd SOFT key.

Move the menu cursor right one field. This control is used to specify the type of averaging to be performed. Options include SUm, EXponential, and PeaK. In addition, this control also specifies the type of data gathering to be used. The second part of the SOFT key labels provide for continuous (2nd part of label blank), TRansient, and PReView modes. Verify that SUm continuous is selected.

Moving the menu cursor right once more selects the averager number control. For the sum averaging type selected, as well as for peak averaging, this number is the number of data ensembles to be included in the average. As for the input calibration constant, a numeric entry (note the message above the entry field) is expected for this control.

The averager number can be set to an integer between 1 and 10,000. Set the number to 12 by pressing CLEAR, 1, 2, and SET on the numeric keypad. (The default averager number is 16.)

Move the menu cursor right once more to the input data weighting function field. Weighting functions include FLAT (no weighting), HANNing, FLaTOP, IMPulse for Channel A, IMPulse for Channels B-D, and IMPulse for ALL channels. Select HANNing weighting.

The last field on the averager view line controls the maximum amount of overlap (or redundancy) of the blocks of data used to update the averager in the continuous data gathering mode. Options for this control include MAXimum (data added to the average as fast as the 804A can process it), 75%, 50%, and 0% (at least a full time window of new data). Select MAX.

VII. SELECTING FUNCTIONS TO VIEW

The functions displayed should still be the instantaneous spectra (ISPEC) of Channels A and B. Press the FUNCT key in the BASIC OPERATIONS group to select the display function view line and to recall the function menu to the SOFT keys.

Right now the first two fields on the view line correspond to the functions being displayed on the upper (ISPEC A) and lower (ISPEC B) graticules. There's a lot of flexibility in associating what's being viewed with functions and formats, but there's no need to be concerned about it at this point.

Display functions are specified in two parts (Chinese menu style). The left 4 SOFT keys are used to select the type of function and the right 4 to select the channels. With the view line field for the upper data selected, you can see that the "ISPEC" label in the left group and "A" in the right group are both in reverse video.

Display functions are listed below with an asterisk (*) preceding dual channel functions.

ITIME = Input Time	ATIME = Averaged Time
ISPEC = Instant Spectrum	RMS = RMS Spectrum
PWR = Power Spectrum	* CROSS = Cross Spectrum
* XFER = Transfer Function	* COH = Coherence Function

The definitions of these functions are summarized in the Guide to 804A Functions and Formats.

For the single channel functions, the right 4 SOFT keys are labeled for choices of Channels A - D as can be seen for the ISPEC function. For dual channel functions, Channel A is always the reference and the right 3 SOFT keys are labeled to select the second channel of the pair.

Now move the menu cursor right one field so that a display function can be specified for the lower graticule. Specify the transfer function (XFER) between Channels A and B (A B). If no averaging has been performed since powering up, there will be no data present on the lower graticule, since the transfer function is an averaged quantity.

Note that the selected view line field and the function label to the left of the lower graticule now both read XFER B/A; so you know exactly what you're looking at. If CROSS had been selected, the label would be CROSS AxB. We'll get to the last two fields on this view line a bit later.

VIII. SELECTING DATA FORMATS

Press the right-most BASIC OPERATIONS key on the middle line to access the FORMaT view line. The title "FMT V,H" indicates that the Vertical format specifier (LiNear, LoG, Real,Imaginary, or PHase) is listed first on the labels and is followed by the Horizontal specifier (LiNear or LoG).

Vertical formats are defined in the Guide to 804A Functions and Formats. Please be sure to note the distinction between "LN" and "R". "LN" is the magnitude and "R" is the real part of a complex vector, with both being displayed in linear formats. The imaginary and phase components are, of course, also displayed as linear. The "LG" vertical format is the logarithmic presentation of the magnitude of the data.

The first two fields on the view line correspond to the data now displayed on the upper and lower traces. The selected formats are also shown to the left of each graticule.

Select the "LG,LG" format for the upper trace to view a log horizontal axis. The scale for the 1 kHz frequency span shows 10 Hz, 100 Hz, and 1000 Hz cycles. The lower limit is 2.5 Hz, which is the frequency resolution.

Now please select the "LG,LN" format for the upper trace. If this format is not already selected for the lower trace, then move the menu cursor to the next field and change it to "LG,LN" also.

IX. RUNNING THE AVERAGER

We set up the averager parameters (averaging mode, type, number, etc.) earlier when the averager control view line was recalled to the view line by pressing AVER. Now it's time to run the averager in order to see the transfer function data.

Press OPER (operate) in the lower line of BASIC OPERATIONS keys. Although whatever was previously in the view line remains there, notice that there is no menu cursor field indicated on the view line or elsewhere on the display. This is because the functions that are now provided as SOFT key options do not correspond to a single control field.

The first two SOFT keys are used to control the averaging process. The functions of the rest of the SOFT keys will not be discussed here. However, if the third SOFT key label indicates that the system is in HOLD, please RELease it since averaging cannot be performed while the system is in hold.

The first SOFT key is an alternate action control used to START and STOP the averager. When START is pressed, any data previously stored in the averager is erased. If an average is stopped by pressing STOP or by reaching the specified number of averages, the second SOFT key may be used to CONTINue averaging. The continue operation does not erase data in the averager.

Press the first soft key to START the averager. Wait until a trace appears on the lower graticule, and then press the first SOFT key again to STOP the averaging. Now press the second SOFT key to CONTINue the average.

After the specified number of averages (12 in our case) is completed, averaging will stop automatically. The STOP label will be in reverse video, and the message AVERAGING COMPLETED will appear above the entry field. Press CLEAR on the keypad to remove the message so that the field will be available for more routine messages (such as ENTER NUMBER).

Obviously, the transfer function data is chopped off, which indicates that the preset vertical full scale limit is too low. This is no problem, though, since the 8Ø4A provides flexibility in changing display limits. Before learning the scaling options, we'll look at how to change the control fields above the view line.

X. NON-VIEW LINE CONTROL FIELDS

So far we've concentrated on the control fields associated with the BASIC OPERATIONS keys. As mentioned earlier, all the brightly lit display fields above the view line also correspond to controls. When the menu cursor is positioned to one of these controls, the field appears in reverse video.

When the menu cursor is positioned on a view line field or when it is not present (such as after pressing OPER), the <-- or --> MENU ITEM SELECT keys can be pressed one or more times until the menu cursor is positioned on a non-view line control field. Try it.

The left and right menu cursor movement keys move the cursor left and right on a line of the display if the line contains more than one control (such as the horizontal scaling and unit lines beneath the graticules). If the cursor is at the end of a line, pushing the --> key will cause the cursor to "wrap around" to the beginning of the next line. This will also cause the cursor to wrap around from the last field above the view line to the first control field on the display. Try pushing the --> and <-- keys when the cursor is at the last or first control field of a display line.

When the menu cursor is positioned on a non-view line control field, the up ( ) and down ( ) arrow keys in the MENU ITEM SELECT group move the menu cursor to a control field on the line above or below its current position. They cause the cursor to wrap between the top and bottom control field lines when limits are reached.

Use the four menu cursor arrow keys to get a feel for positioning the cursor on the display. Notice that positioning the cursor on the function and format labels to the left of a graticule provides an alternate method of accessing these controls. Sometimes one method will be more convenient and sometimes the other. For example, if formats are to be specified for all four data traces, then the FORMT key will be the easiest route. Other times it'll be more efficient to move the cursor from field to field on the display.

XI. VERTICAL SCALING

Now let's get back to changing the vertical full scale limit for the lower trace. The vertical axis now on the display should reflect the wake-up state scaling. The preset vertical log full scale (FS) is 1 volt, the minimum (MN) is 80 dB down, and grid lines are drawn every 10 dB. Separate linear and log full scale and minimum limits are stored in the 804A for each trace.

Move the menu cursor to the field entitled "FS" at the upper left of the lower graticule. The SOFT keys provide various options for changing the full scale limit. In addition, the message ENTER NUMBER OR SELECT above the entry field indicates that a direct numeric entry is an alternative to selecting a SOFT key option.

If you're not sure of the range of the data, the SOFT keys should be used. We won't go into the details of the options here but will briefly mention what's available. The full scale limit can be:

- INCReased or DECReased to the next "nice" value (a power of the square root of 10 for a log transfer function).

- SET TO the data CURSOR amplitude (data cursors are coming up next).

- AUTOSCALEd (804A determines the limit).

- Left unchanged, if positive, with the minimum limit being set to the negative of full scale and thus ZERO in the CENTER (INVALID for log).

- Set to the FULL VIEW (same as AUTO SCALE for log; minimum is also autoscaled for linear).

Select the AUTO SCALE option to find out what the maximum amplitude really is. The full scale setting now shown in the control field probably isn't too "nice"; so the upper and lower 10 dB grid lines don't coincide with the graticule. Press INCR once or twice to adjust the axis limit to a "nicer" number.

After autoscaling to find the maximum, you then have enough information to enter an intelligent new full scale value on the numeric keypad as an alternative to pressing INCR. The full scale value is a floating point number entered with or without a decimal point or exponent. For example, 1000 could be entered simply as 1000, as 1000.0, as .1 EXP + 04, etc. Experiment with entering a few values for the vertical full scale. Each time you change the value,

1. press CLEAR,
2. type the new value,
3. press SET.

After experimenting, please set the value to 100.

XII. VERTICAL AND HORIZONTAL READINGS

A. CONTROLLING THE DATA CURSOR

Once data of interest is present on the display, one of the most common initial requirements is to obtain readings of amplitudes and horizontal positions. This is easily accomplished on the 804A by using the data cursor. The keys directly beneath the SOFT keys are used to control the data cursor.

The cursor ON/OFF key is an alternate action key. Press it to turn the cursor on. A solid cursor line will appear on the upper trace. If the cursor has not been moved since powering up, the line will be at the origin.

Notice that two readings are present at the upper left of the display. The left reading is amplitude and the right is the current horizontal position of the cursor in Hz. The cursor readings now apply to the upper trace which is instantaneous data; so the amplitude will naturally be changing.

The right four keys in the CURSOR group are the data cursor movement keys and are labeled with large and small left and right arrows. The small arrows move the cursor left and right in increments of one data element. The large arrows move it in much larger increments to provide faster cursor movement. All of these keys repeat automatically if held down for about one second. The cursor wraps around to the beginning or end of the display if the opposite edge is reached.

Use the four movement keys to get the feel of making the cursor single-step, slew, and wrap around on the upper data trace. Then position the cursor to 250 Hz.

B. DATA CURSOR FEATURES ON A DUAL DISPLAY

Since we're viewing two data traces, let's see how to get the cursor down to the lower trace. First press the TYPE key in the CURSOR group. The SOFT keys are broken down into three groups labeled CURSOR TYPE, CURSOR ACTIVE, and CURSOR COPY.

The cursor type is set to SiNGLe, as opposed to SIDEBanD or HARmonic. The single data cursor is the easiest to use and the type most generally used; so leave the setting at SNGL. As already observed, a single vertical cursor line is present on the trace for this cursor type. The three basic cursor types are available on all data displays.

On a dual display, the cursor may be active on the 1ST (top for the split type display we're viewing), 2ND, or BOTH traces. Currently it is active on the 1ST. Select 2ND, and move the cursor around on the bottom trace a bit. Then position the cursor to 500 Hz.

Now select BOTH, and notice that there are two sets of cursor readings and a cursor line on each trace. Use the cursor movement keys. The cursors move in the same increments but at different locations. For some types of data and applications, it's useful for the two cursors to be locked to the same location. The right two SOFT keys are used for copying the cursor location of one trace onto the other. For example, select the UP option to move the cursor on the upper trace to the horizontal position of the lower trace cursor.

C. LOTS OF EXTRA CURSOR FEATURES

There are many other ways of using cursors on the 804A (such as changing cursor read-out units, making scaled and relative readings, and using Sideband and Harmonic cursors) that help simplify measurements and analysis. These subjects are covered in the standard 804A manual and in an application note.

XIII. A QUICK TOUR OF DATA DISPLAYS

A. DATA PRESENTATIONS

Up to this point we've just been looking at the dual split data display, but there are many more display possibilities. This flexibility allows you to select the display that presents the data in the clearest manner for a particular application. The basic principles of setting controls and running the averager that we've discussed so far are independent of the display being viewed.

Data displays are selected by the SiNGLe, DUAL, and QUAD keys in the DISPLAY key group which is located at the lower left of the keyboard.

B. SINGLE DISPLAYS

Press SNGL to select a full screen display of a single trace. The vertical extent of this display allows fine details to be observed while still showing the full range of the data.

Notice the title SINGLE DSP to the left of the graticule. The number beneath this title is the trace number of the data currently being displayed. If single displays have not been viewed since powering up, the trace number will be "1". This is the same trace that was shown on the top graticule of the dual split display.

Press SNGL again. The trace number will change to "2", and the transfer function that had been viewed on the lower graticule will be shown. Press SNGL again to observe trace 3 and once more for trace 4. The data initially associated with traces 3 and 4 correspond to the input time signals for Channels A and B. Pressing SNGL again will return trace 1 to the screen.

C. DUAL DISPLAYS

Press the DUAL key to recall the familiar dual split display. Dual displays are useful whenever two functions are to be compared. The control field beneath the title SPLIT indicates the trace numbers being displayed. Move the menu cursor to this field. The SOFT keys will be labeled for dual trace pair options.

Verify that the "1 & 2" pair is selected. Move the menu cursor to the function field for the upper trace and select "XFER A B". Then select the "PH,LN" format. Select either the full scale (FS) or minimum (MN) vertical scale field, and specify "FULL VIEW". Now the phase and magnitude of the transfer function of the A and B inputs are on the upper and lower graticules.

There are two other types of dual displays. Press DUAL again, and the two traces will be overlapped in one graticule. Press DUAL once more for a dual Nyquist display. Here the first trace is plotted vs. the second. The horizontal axis is the first trace (phase).

Press DUAL again to return to the dual split display. Now we'll set up data for traces 3 and 4 before going on to quad displays. Move the menu cursor to the dual trace pair field and select traces "3 & 4". For the upper trace, select "XFER A B", "I,LN", and "FULL VIEW" for the vertical axis (FS or MN field). For the lower trace, select "XFER A B", "R,LN", and "FULL VIEW" for the vertical axis.

D. QUAD DISPLAYS

Press the QUAD key to obtain a split display of all four traces. The display should look similar to Figure 4. The transfer function phase, magnitude, imaginary, and real appear from top to bottom. The horizontal grid lines are omitted on the second trace to indicate that its vertical format is log. The other traces all have linear vertical formats.

QUAD SPLIT DISPLAY

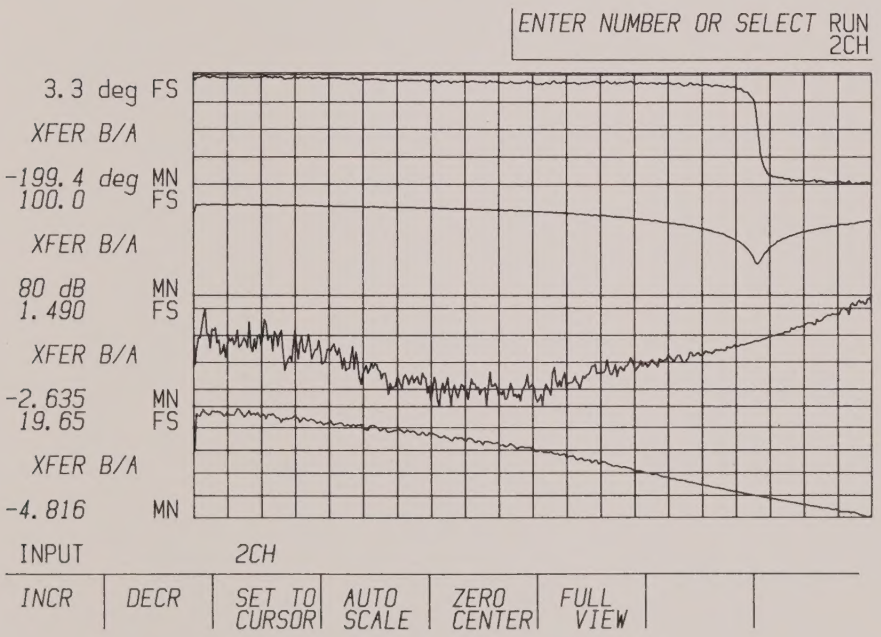

FIGURE 4

Press QUAD again to overlap the four traces in a single graticule. There are two quad Nyquist displays. The first (press QUAD again) is a split display in which traces 1 vs. 2 are shown on the upper graticule and 3 vs. 4 on the lower. Press QUAD a final time to obtain the quad overlapped Nyquist display. Here the 1 vs. 2 and 3 vs. 4 Nyquist diagrams are shown overlapped.

XIV. SUMMARY

The basic steps for using the 804A are summarized below.

- Connect Inputs and Set Input Controls
- Set Frequency Controls
- Set Averager Control Parameters
- Select Display Functions
- Select Data Formats
- Average the Data (if necessary)
- Scale the Results

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